

WHAT IS CLAIMED IS:

1. A composite stent-graft tubular prosthesis comprising:

an inner PTFE tubular structure;

an outer PTFE tubular structure positioned about said inner PTFE tubular structure; and

5 a diametrically deformable stent interposed between said inner and outer PTFE tubular structure, said stent being formed from an elongate wire helically wound with a plurality of longitudinally spaced turns into an open tubular configuration, each of said turns including successive upper and lower wave-like peaks wherein selective ones of said upper and lower peaks are exposed exteriorly of said outer PTFE structure.

10 2. A composite stent-graft prosthesis of claim 1 wherein said outer PTFE tubular structure includes a plurality of slits therethrough, said selective upper and lower peaks extending through said slits.

15 3. A composite stent-graft prosthesis of claim 1 wherein said outer PTFE tubular structure includes a plurality of apertures therethrough and wherein said selective upper and lower peaks are aligned with said apertures.

20 4. A composite stent-graft prosthesis of claim 3 wherein said upper peaks of one turn are juxtaposed with respect to said lower peaks of an adjacent turn.

5. A composite stent-graft prosthesis of claim 4 wherein each aperture of said outer tubular

structure exposes said juxtaposed upper and lower peaks.

6. A composite stent-graft prosthesis of claim 1 wherein said inner and outer PTFE tubular structures are formed of sheets.

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7. A composite stent-graft prosthesis of claim 1 wherein said outer PTFE tubular stent is adheringly secured to said inner PTFE tubular structure at spaces between said wound wire.

8. A composite stent-graft prosthesis of claim 7 wherein said outer PTFE tubular structure is laminated to said inner PTFE tubular stent.

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9. A composite stent-graft tubular prosthesis comprising:

a first PTFE tubular structure;

a diametrically deformable stent positioned over said first PTFE tubular structure, said

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stent being formed of an elongate helically wound wire formed into an open tubular

configuration by a plurality of turns, said helically wound wire including a plurality of transverse generally wave-like undulations therealong defining successive upper and lower peaks; and

a second PTFE tubular structure positioned over said stent, said second PTFE tubular structure including a plurality of apertures therethrough, said apertures being aligned with

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selective ones of said upper and lower peaks to expose said upper and lower peaks to thereby enhance longitudinal flexibility of said prosthesis.

10. A composite stent-graft prosthesis of claim 9 wherein said stent includes said wave-like undulations being arranged such that the upper peaks of one turn are juxtaposed with the lower peak of an adjacent turn.

5 11. A composite stent-graft prosthesis of claim 10 wherein said aperture of said second PTFE tubular structure are aligned with selective ones of said juxtaposed upper and lower peaks.

12. A composite stent-graft prosthesis of claim 11 wherein said first and second tubular structures are formed of expanded PTFE.

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13. A composite stent-graft prosthesis of claim 11 wherein said first and second tubular structures are formed from PTFE sheets.

15 14. A composite stent-graft prosthesis of claim 9 wherein said first PTFE tubular structure is laminated to said second PTFE tubular structure through said wound wire.

15. A method of forming a stent-graft prosthesis comprising the step of:
forming a first PTFE tubular structure;
positioning a stent over said first PTFE tubular structure, said stent having a tubular
20 configuration formed of a plurality of turns of a helically wound wire, each of said turns including successive upper and lower wave-like peaks;
forming a second PTFE tubular structure over said stent; and

exposing selective ones of said upper and lower wave-like peaks through said second PTFE tubular structure.

16. A method of claim 15 further including the step of adheringly securing said first PTFE tubular stent to said second PTFE tubular structure through spaces between said wound wire.

17. A method of claim 16 wherein said exposing step includes:
placing a plurality of slits through said second PTFE tubular structure at a location aligned with said selective upper and lower peaks of said stent; and
extending said upper and lower peaks of said stent through said slits.

18. A method of claim 17 wherein said extending step includes:
lifting said selective upper and lower peaks;
tucking a portion of said second PTFE tubular structure adjacent said slit, under said upper and lower peaks.

19. A method of claim 17 wherein said placing step includes:
cutting said slits using a cutting tool.

20. A method of claim 17 wherein said placing step includes:
laser burning said slits through said second PTFE tubular structure.

21. A method of claim 16 wherein said exposing step includes:

forming said second PTFE tubular structure with a plurality of apertures, said apertures being at a location adjacent said selective upper and lower peaks.

5 22. A method of claim 15 wherein said second PTFE tubular structure is sintered prior to said exposing step.

23. A method of claim 15 wherein said second PTFE tubular structure is sintered subsequent to said exposing step.

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